CHAPTER 2

Getting Started

Includes:
- ☐ How to Define P2
- ☐ Sustainable Development
- ☐ Integrating the New P2 Program into Core Business Practices
- ☐ Who Should Implement P2?
- ☐ When Will You Begin?
- ☐ Lessons Learned from Past P2 Programs
- ☐ Dealing with Change
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So you have decided to move from conducting specific P2 projects to having a formal P2 program. Maybe you are just trying to revive an older P2 program in your organization. In either case, this section of the *Guide* will provide you with information to consider before beginning your P2 program planning process.

HOW TO DEFINE P2

It is important to decide how you will define P2. In order to know what you can include in your P2 program, it helps to know what is possible. There are many definitions available to choose from and many programs that are closely related to P2. We will present a few P2 concepts to help you determine where you wish to focus your efforts. First, the definition of pollution prevention adopted by the U.S. Environmental Protection Agency (EPA) is provided in Box 2-1.

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Box 2-1. Pollution Prevention Definition

Pollution prevention means "source reduction" (as defined under the Pollution Prevention Act) and other practices that reduce or eliminate the creation of pollutants through:

- increased efficiency in the use of raw materials, energy, water, or other resources, or
- protection of natural resources by conservation.

The Pollution Prevention Act defines *source reduction* to mean any practice that:

- reduces the amount of any hazardous substance, pollutant, or contaminant entering any waste stream or otherwise released into the environment (including fugitive emissions) prior to recycling, treatment, or disposal
- reduces the hazards to public health and the environment associated with the release of such substances, pollutants, or contaminants.

Under the Pollution Prevention Act, recycling, energy recovery, treatment, and disposal are not included within the definition of pollution prevention. Some practices commonly described as "in-process recycling" may qualify as pollution prevention.

From Hank Habicht's EPA memorandum of May 28, 1992 (Reference 2-1)

The EPA definition stresses the importance of placing source reduction at the top of a "waste management hierarchy." Recycling, proper treatment, and safe disposal of the residues are farther down the hierarchy. There are other similar P2-like concepts that some feel compete with the EPA definition.

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The international community has adopted the term *cleaner production.* As you can see from the definition of cleaner production in Box 2-2, it has a broader meaning than the one we give to the term P2. The final term *eco-efficiency* is used extensively in the sustainable development arena and is defined in Box 2-3.

Cleaner production *is the continuous application of an integrated preventative environmental strategy applied to processes, products, and services.*

Box 2-2. Cleaner Production Definition

Cleaner production is the continuous application of an integrated preventative environmental strategy applied to processes, products, and services. It embodies the more efficient use of natural resources and thereby minimizes waste and pollution as well as risks to human health and safety. It tackles these problems at their source rather than at the end of the production process; in other words, it avoids the 'end-of-pipe' approach.

For processes, cleaner production includes conserving raw materials and energy, eliminating the use of toxic raw materials, and reducing the quantity and toxicity of all emissions and wastes.

For products, it involves reducing the negative effects of the product throughout its life-cycle, from the extraction of the raw materials through to the product's ultimate disposal.

For services, the strategy focuses on incorporating environmental concerns into designing and delivering services.

United Nations Environment Program (Reference 2-2)

Box 2-3. Eco-efficiency Definition

Eco-efficiency is the efficiency with which ecological resources are used to meet human needs. It is expressed as the ratio of an output—the value of products and services produced by a firm, a sector, or the economy as a whole—to the "input"—the sum of environmental pressures generated by the firm, sector, or economy. Measuring eco-efficiency depends on identifying indicators of both input and output.

The World Business Council for Sustainable Development (WBCSD) (Reference 2–3) considers that eco-efficiency places seven demands on a firm:

1. Reducing material intensity of goods and services
2. Reducing energy intensity of goods and services
3. Reducing toxic emissions
4. Enhancing material recyclability
5. Maximizing sustainable use of renewable resources
6. Extending product durability
7. Increasing the service intensity of goods and services

All three of these terms—pollution prevention, cleaner production, and eco-efficiency—address:

1. Elimination of process losses at the source without resorting to end-of-pipe pollution control devices.
2. Conservation of resources (including energy, materials, and water) that are used in the process or operation.

There are also some differences between these terms. For example, **eco-efficiency** looks at maximizing the sustainable use of renewable resources while **cleaner production** focuses on the more efficient use of natural resources. **P2** looks at the protection of natural resources by conservation. All of the definitions address hazards to public health and the environment and seek to reduce toxic emissions and the use of toxic raw materials. However, only cleaner production addresses the need to consider whether there is a shift in risk from the environment to worker safety as a result of changes made in the process.

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Eco-efficiency and cleaner production address processes, products, services, and life cycle issues. P2 considers "in-process recycling" while eco-efficiency considers "enhancing material recyclability."

The authors use the term P2 throughout this *Guide.* However, you can choose to add elements of cleaner production and/or eco-efficiency to your program if you wish to do so. The definitions of these terms are provided to help you see what is possible. There are organizations already incorporating many of these additional items into their P2 programs. P2 can be defined more broadly than EPA originally intended.

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SUSTAINABLE DEVELOPMENT

P2 plays an important role where the goal is sustainable development. There are many definitions of sustainable development. The following definitions provide broad and operational perspectives to cover the range of components that are commonly included under the sustainability umbrella. According to the World Commission on Environment and Development, "sustainable development is a process of change in which the exploitation of resources, the direction of investments, the orientation of technological development, and institutional change are all in harmony and enhance both current and future potential to meet human needs and aspirations." An operational definition of sustainable development is "Good stewardship of natural resources such that long-term productivity may be maintained or improved with minimal, if any, adverse impacts on the environment and worker health and safety."

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If your organization is interested in a sustainable development goal, it is important to consider setting a goal of zero waste or zero emis-

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sions (Reference 2–4). For some organizations, this goal may seem unrealistic. However, many organizations reach these goals by converting previously unused wastes into other products and driving their programs to near zero waste. This zero concept is very popular in the quality movement and more particularly with a program referred to as "six sigma" (i.e., attaining the goal of only 3.4 defects per million operations instead of the 35,000 to 60,000 defects per million operations that most very competitive organizations now tolerate). This number of defects is very close to zero. Some organizations have extended the six sigma approach to regulatory compliance issues where they consider a "notice of violation" a defect. However, more progressive organizations use six sigma to *prevent* regulatory compliance issues.

INTEGRATING THE NEW P2 PROGRAM INTO CORE BUSINESS PRACTICES

When getting started with a P2 program, look around to see what other types of "prevention" programs already exist in the organization.

Organizations considering a P2 program may already have compatible programs in place. When getting started with a P2 program, look around to see what other types of "prevention" programs already exist in the organization. Box 2-4 lists some prevention-oriented programs that currently exist in many organizations. Can the P2 program be tied to any of these or similar programs? The integration of the P2 program into existing core business practices can help small organizations find resources to start a new P2 program and large organizations consolidate existing programs, allowing each to remain competitive in the global marketplace as they implement P2.

Box 2-4. Typical Prevention Programs in Industry

- Environmental management systems
- Quality management initiatives
- Preventive maintenance
- Health and safety programs
- Insurance/risk management

Environmental Management Systems

This Guide *will provide some methods you can use to emphasize P2 within an EMS.*

One program that may be compatible with a new or revised P2 program is an environmental management system (EMS). One popular EMS format, known as ISO 14001, has been issued by the International Organization for Standardization (Geneva, Switzerland). ISO 14001 is a management system standard, not a performance standard, providing a general framework for organizing the tasks necessary for effective environmental management. This approach may prove effective in encouraging the organization to take an active, preventive, and systematic approach to managing its environmental impacts. This *Guide* will provide some methods you can use to emphasize P2 within an EMS (see Chapter 6). An EMS protocol requires the organization to

consider the **prevention of pollution,** compliance with all legal requirements, and continual improvement**.** Like P2, an EMS seeks to integrate environmental concerns into core business practices.

Quality Initiatives

Quality initiatives focus on preventing defects in processes, products, and services.

Quality initiatives focus on preventing defects in processes, products, and services. These initiatives often declare a "war on waste." However, too few also consider air emissions, water discharges, solid and hazardous wastes, and spills and leaks to be a waste. Organizations develop ISO 9000 programs to deal with quality. ISO 9000 programs are prepared in the same format as the ISO 14001 program. Quality initiatives have evolved just as P2 has been defined and refined. Many people have less than fond memories of certain management fads like "Total Quality Management (TQM)." Despite the approaches and fads that cycle in and out, most organizations would agree that quality refers to everything an organization does to provide goods and services that meet customer requirements, the way that organization's employees interact together, and the organization's expectations of its suppliers and other interested parties. Developers of P2 programs should become familiar with the quality improvement initiatives in the organization.

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Some organizations use the Baldrige criteria to judge their overall operating performance. The Malcolm Baldrige National Quality Program is the Presidential Award program in the United States (Reference 2-5). These performance-based criteria are currently used in approximately 50 countries and 44 of the 50 states to help improve competitiveness in both manufacturing and service businesses. An environmental excellence program has been developed in New Mexico using the Baldrige model. This Green Zia Program is used to rate organizational environmental programs that "go beyond mere compliance." This program (Reference 2-6) helps an organization establish core values for its program and demonstrates how quality and P2 can be effectively integrated. A set of criteria and a rigorous scoring system allow any organization to track and search for trends in its continual improvement using a unit-less score. This eliminates the need to "normalize" for production. These concepts are covered in Chapter 7.

Preventive/Predictive Maintenance

Unscheduled equipment downtime often leads to the generation of wastes in organizations.

Preventive and/or predictive maintenance is designed to keep machinery from breaking down. Unscheduled equipment downtime often leads to the generation of wastes in organizations. There are a number of Internet sites dedicated to the topic of preventive/predictive maintenance (Reference 2–7). The principles from this field are applicable to P2 programs.

Safety

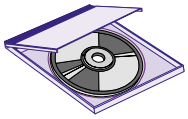
Safety has always had its focus on preventing *incidents and exposures.*

Many environmental managers are gaining some oversight of the safety function in their organizations. Organizations track safety closely because it impacts worker compensation rates and related insurance costs. P2 training and safety training are often combined in organizations to stress the prevention message. Safety has always had its focus on *preventing* incidents and exposures. There is information on safety available on the Internet (Reference 2-8).

Insurance/Risk Management

Insurance companies and organization risk management professionals frequently audit organization processes and facilities to prevent property loss and other forms of insurable risk. P2 programs should collaborate with risk management personnel, whether in the company or sent by the insurance company.

WHO SHOULD IMPLEMENT P2?



Many states have legislatively mandated programs that require P2 planning while others have programs that encourage voluntary P2 planning.

Many states have legislatively mandated programs that require P2 planning (Reference 2-9) while others have programs that encourage voluntary P2 planning (see the CD-ROM for further information on these statutes). The focus of most state P2 planning programs is the environmental manager. However, it is becoming clear that operational changes not commonly controlled by the environmental manager are needed to make P2 work. Recognizing this point, many organizations are establishing **multi-functional teams** to provide oversight of their waste-elimination efforts. These teams often include environment, operations, accounting, and a variety of other internal service providers and functions. Representatives from upper management are often essential members of such P2 oversight teams.

For maximum effectiveness, workers need to be directly involved in P2 program development.

Although a commitment to the P2 program should begin with management (i.e., top-down approach), line employees can often suggest valuable improvements in operations and procedures (i.e., bottom-up approach). For maximum effectiveness, workers need to be directly involved in P2 program development. The Quality model (Chapter 7) stresses this need by dedicating one of its seven performance criteria categories to worker involvement. Many organizations use P2 tools to give everyone a common frame of reference and to enhance problem-solving and decision-making skills. Management can authorize and give responsibility to worker teams to implement the P2 program. Management should also monitor all P2 efforts periodically. Whether an organization runs a service business or operates in a manufacturing setting, it can implement a successful P2 program.

WHEN WILL YOU BEGIN?

As mentioned previously, you may have already started your P2 efforts. Perhaps you have had some P2 successes and are now seeking ways to formalize and sustain the program. Maybe this is the first time you have formally looked at eliminating waste from the organization. If so, you might wish to start by preparing a list of all the projects you have implemented in the past two or three years that would fit under the heading of P2. Make sure that representatives of all parts of the organization participate in the creation of this list. As you begin to focus on P2, many organizations are able to double or triple the number of P2 projects appearing on their listing of past accomplishments. As more people get involved in P2, they may begin to recognize that they have most likely been doing some of this all along. Resolve to keep this list current and share it with regulators, customers, suppliers, community organizations, and all other interested parties. Then prepare to start your new P2 program.

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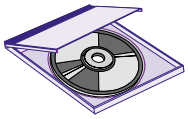
LESSONS LEARNED FROM PAST P2 PROGRAMS

There is a substantial body of literature on P2 efforts in the United States and internationally. References to much of this P2 literature is included on the companion CD-ROM. Some of the lessons learned during those efforts specific to the preplanning phase are described in the following paragraphs.



The implementation of P2 projects can yield some modest, immediate benefits. However, the big payoff from P2 often requires a program that is integrated into the operations of the organization and supported for a minimum of two to three years. Like quality, P2 is a mindset that needs to permeate into the culture of the organization. One of the greatest P2 myths is that a P2 program is a "quick fix" used to turn around organizations. Many P2 programs do not offer instant financial success. P2 is a long-term effort with *both* long- and potential short-term bottom-line benefits.

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P2 is a long-term effort with both *long- and potential short-term bottom-line benefits.*

P2 success requires full financial support as well as management commitment. Resources that will be needed include funds, people, training, facilities, support structure, and, in some cases, the adoption of new technology. Often projects that are already funded can be turned into P2 projects by emphasizing different aspects. Other financial commitment concerns will be covered in Chapter 4.

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Some have said that P2 is a way of life, not a new program. P2 requires many changes in behavior that cannot be demanded. The goal of P2 is to institutionalize the philosophy and guiding principles as part of the organization. This can only be accomplished by continual actions that reinforce P2 behaviors. Since people resist change, a move to new prevention methods involves a campaign for their hearts as well as their minds.

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Change occurs because people as a group accept it. Approach such change deliberately. Involve the organization's members and listen to them. Be responsive to their needs and ideas. When change represents a new work style for people, allow time to adjust to it and experiment with it. An idea approached as a pilot project may be accepted more readily than one imposed as a permanent change. You can combat resistance by surrounding the organization's members with a network of familiar activities, support, and guidance. Encourage them to feel anchored to the direction and mainstream activities of the organization.

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Change management is a fundamental and critical element of P2 program implementation. Failure to develop bureaucracy-elimination initiatives, communication improvement, and training programs sends mixed signals to the employees. Empowering teams to fully implement the new P2 behaviors is central to successful change management.

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Many P2 consultants and P2 technical assistance providers have tried to sell P2 as an environmental program. Your organization will probably find greater success by linking P2 to its strategic needs. Address the true scope and impact of P2 as part of managing your business needs. To increase your effectiveness, integrate the P2 program into the organization's core business practices. The business case needs to be made for all P2 projects. Success needs to be measured economically, as well as in volume and weight.

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DEALING WITH CHANGE

Instituting a P2 program can facilitate change in an organization.

Instituting a P2 program can facilitate change in an organization. Technical savvy and operational knowledge are not sufficient by themselves. Everyone in the organization must change to make P2 work. This will not be easy. There are seven things you should consider when you start a P2 program in your organization:

Everyone in the organization must change to make P2 work.

- **Present reason for change.** If you want people to change, persuade them of the need for change. This might be accomplished as part of a "war on waste" or related to issues surrounding competitive advantage. The very reasons that organizations are trying to become "lean" are the same reasons that P2 should be an integral part of that program. What is management pointing to when it seeks change? How is P2 related to that change? Moving more money to the bottom line is important in a private organization. Maintaining the same mission with fewer funds is a common cause for many not-for-profit and government organizations. Many times money has something to do with the need for change. This should make P2 very attractive.

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- **Offer a compelling vision.** The concept of having a P2 vision will be covered in the next chapter. Everyone will be asking, "How will things be better with the change?" All P2 projects must fit the vision and must be related to the reason for change previously stated. Finding the right vision will be challenging. However, once found, it will provide the rallying call that is often missing in a P2 program.
- **Show results quickly!** Many successful P2 programs gain momentum when economic benefits are demonstrated. P2 programs should pay for themselves. Do not measure progress by the number of activities (i.e., P2 opportunity assessments, P2 teams in action, opportunities identified, etc.) or pounds or volume of waste avoided. P2 goals are best measured in dollars—enough dollars to provide an incentive to keep the P2 program going from year to year. It could even be treated as a profit center in a private sector organization. All organizations can support value-added programs.
- **Communicate, then communicate some more.** You can never do enough to get the P2 message across to all interested parties—workers, suppliers, regulators, customers, the community, and all other interested parties. Keep the communication simple so everyone can understand what is going on. "Walk the talk" at all levels of the firm, even top management. Provide incentives for suppliers to join the program. Show the customers how the program can benefit them. Join in the regulators' voluntary programs that encourage waste reduction.
- **Build a strong, committed management P2 guiding team.** This high-level oversight team should sponsor all P2 efforts while articulating the P2 vision, fostering communication, eliminating obstacles, coaxing the short-term wins, serving as mentors to the worker P2 teams, and embedding new approaches into the organization's culture. Generally, whenever such a team is present, the P2 program has a much higher level of success. Implementation of P2 through the intervention of only vendors, consultants, and technical assistance providers reduces the chance of success. The P2 program must be internalized, continuously reinforced, and rewarded by management in order to yield long-term results.
- **Add some level of complexity to the P2 program.** This may sound counter-intuitive, but breakthrough complex change may be easier to accomplish than incremental change. Integrating P2 into core business practices instead of relegating it to environmental personnel is one way to accomplish this goal. To maximize integration, change every-

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thing at the same time. P2 should be a collaborative effort with operations department efforts to increase productivity.

- **As stated previously, people do not resist their own ideas.** Involve the organization's members in the change. Rely on outside expertise and technical assistance only to *facilitate* internal change. Provide the needed resources required to *initiate* the P2 program. People who participate in deciding what P2 changes are needed and how they will occur are more likely to support the changes and advance the program. Provide training and lessons learned to increase the success of the P2 program.

Chapter 3 will describe some of the elements that will help make the P2 program work and thrive.

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